

### REQUEST FOR RECONSIDERATION

The Office rejects Claims 1-14 as obvious under the meaning of 35 U.S.C. § 103(a) in view of a combination of U.S. patents to Dickman (U.S. 6,465,118), Okamoto (U.S. 6,045,933) and Wattelet (U.S. 6,824,906). The Office cites to Dickman as disclosure of a thermal energy recovery system for use in a fuel processing system for a fuel cell having a heat exchange system (page 3, lines 4-5 of the November 29, 2006 Office Action).

The fuel cell apparatus of the presently claimed invention includes a heat exchange unit having a first heat exchanger for eliminating moisture from the fuel-containing material supplied to the fuel cell (see Claim 1). In contrast, Dickman discloses the use of heat exchange systems for harvesting thermal energy from the prior art fuel processing system, i.e., collecting heat from the out-going gases (see for example, column 2, lines 60-67; column 3, lines 4-9; column 3, lines 34-36; column 4, line 1; column 4, lines 5-8; column 4, lines 22-25; column 4, lines 27-28; column 4, lines 37-38; column 4, lines 51-52; and column 5, line 3 of Dickman).

Applicants submit that it is readily evident that the Dickman prior art heat exchanger carries out the purpose of harvesting thermal energy from out-going gases (e.g., capturing heat from the reacted gases of the prior art fuel processing system). The heat thus harvested may be used to heat different portions of the Dickman fuel processing system. Dickman nowhere discloses or suggests treating an incoming fuel or oxidant stream with a heat exchanger in a manner that would dehumidify or cool such a stream. The functionality of the Dickman heat exchanger is entirely different from the functionality and effect of the heat exchanger of the presently claimed invention; namely, the Dickman heat exchanger harvests heat from an out-going gas stream so that the prior art fuel processing system may be heated whereas the heat exchanger of the presently claimed invention cools an in-coming gas stream to dehumidify it.

Applicants submit that on at least this basis the Office's rejection of the present claims in view of Dickman makes no sense, alone or in combination with Okamoto.

How can a heat exchanger that harvests heat from the out-going gases of a fuel processing system be equivalent to or render obvious a heat exchanger that cools an incoming gas stream to dehumidify it?

The Office even concedes that Dickman fails to teach the use of a heat exchanger to dehumidify a fuel inlet stream. In order to remedy this deficiency the Office applies Okamoto as a teaching of a fuel cell having a fuel inlet stream passing through a heat exchanger containing a coolant medium.

The Office rationalizes the combination of Dickman and Okamoto on the following ground:

It would be desirable to use the heat exchanger of Dickman et al. to remove moisture from the fuel inlet stream if the moisture level in the fuel cell stack is sufficient as taught by Okamoto.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the heat exchanger of Dickman et al. to remove moisture from the fuel inlet stream if the moisture level in the fuel cell stack is sufficient as taught by Okamoto.

See the last paragraph on page 3 and the first paragraph on page 4 of the November 29, 2006 Office Action.

Applicants submit that the Office's basis for combining Dickman and Okamoto makes no sense. Applicants submit that the heat exchangers of Dickman are used only to harvest thermal energy and in this manner could not conceivably be used for dehumidification. Dickman does not in any way suggest the use of the prior art heat exchanger for treating any incoming fuel or oxidant stream, particularly with regard to dehumidification. Applicants submit it makes no sense to use the heat exchanger of Dickman in any device of Okamoto on the grounds that those of ordinary skill in the art would readily

recognize that Dickman's use of a heat exchanger to harvest thermal energy from out-going gases is not compatible with Okamoto's use of a heat exchanger to cool in-coming gases.

The Office further supports the rejection by citing to column 8, lines 37-53 of Okamoto and appears to argue that this disclosure makes up for the deficiencies of Dickman. Applicants traverse the Office's assertion in this regard and draw the Office's attention to column 8, lines 45-47 which states:

The dehumidifying means 162 is provided as a coolant medium circuit for conducting heat exchange together with the fuel gas, ...

Thus, the dehumidifying of Okamoto is carried out with a coolant medium. This is in direct contrast to the heat exchange system of Dickman wherein the heat harvesting is carried out with a heat exchange medium deriving from a heat reservoir (e.g., a heated heat exchange medium).

The Office's combination of Dickman and Okamoto ignores this basic difference of the two prior art references. The Office makes no attempt to explain why it would be obvious to substitute Dickman's heat exchange unit that utilizes a heated medium (i.e., the heat reservoir of Dickman) with the dehumidifying device of Okamoto that uses a coolant medium.

Applicants further submit that the combination of Dickman and Okamoto is legally insufficient to render the claimed invention obvious because the Office failed to provide any reasoned technical argument (e.g., motivation) why it would be obvious to use the heat exchanger of Dickman in the device of Okamoto in view of the fact that the heat exchanger of Dickman is functionally not equivalent to the heat exchanger (e.g., dehumidifying device) of Okamoto.

For at least these reasons, Applicants submit that the combination of Dickman and Okamoto is not legally supportable and does not constitute acceptable grounds of *prima facie*

obviousness. Applicants thus respectfully submit that the rejection is not supportable and should be withdrawn.

Applicants further submit that Wattelet does not cure the deficiencies of the Office's rejection. In fact, the Office even concedes that Wattelet teaches a heat exchanger for "a cathode exhaust condenser". As already stated above, Applicants submit that harvesting heat from out-going gases (i.e., condensing the exhaust gases from the Wattelet fuel cell) is in no way similar to dehumidifying an in-coming fuel gas stream or oxidant gas stream. Thus, the further combination of Wattelet with either or both of Dickman and Okamoto cannot render the presently claimed invention obvious.

Likewise, the other prior art, e.g., Shimanuki, fails to address the deficiencies noted above.

Applicants respectfully request withdrawal of the rejection and the allowance of all now-pending claims.

Respectfully submitted,

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